



UNITED STATES DEPARTMENT OF COMMERCE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/557,961	04/25/00	TAKATANI	K 245402001600

BARRY E BRETSCHNEIDER
MORRISON & FOERSTER LLP
2000 PENNSYLVANIA AVENUE NW
WASHINGTON DC 20006-1888

MMC1/0615

EXAMINER

KANG, D

ART UNIT

PAPER NUMBER

2811

DATE MAILED:

06/15/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/557,961

Applicant(s)

TAKATANI, KUNIHIRO

Examiner

Donghee Kang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) 6 and 7 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claims ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☒ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/557,961.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 18) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: _____

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Election/Restrictions

2. Applicant's election without traverse of Group I (Claims 1-5) in Paper No. 7 is acknowledged.

Claim Objections

3. Claim 5 is objected to because of the following informalities: The expression of "nitride of a metal included in said first metal group" is misdescriptive because nitride is not a metal. Even if the nitride were metal, there is no nitride metal in the first metal group. Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated by Kim et al. (Mat. Res. Soc. Symp. Proc. Vol. 449, 1997, pp 1061-1065).

Regarding claim 1, Kim et al discloses an electrode structure on a p-type III group nitride semiconductor layer comprising first, second and third electrode layers successively stacked on semiconductor layer, wherein the first electrode includes a Cr, second electrode layer includes a Ni, and third electrode layer includes Au. See *Abstract and page 1063*.

Regarding claim 2, Kim et al discloses a thickness of first electrode layer is a 15 nm which is in the claimed ranges. See *page 1061, lines 31-32*.

Regarding claim 3, Kim et al discloses a thickness of second electrode layer is a 15 nm which is in the claimed ranges. See *page 1061, lines 31-32*.

Regarding claim 4, Kim et al discloses a thickness of third electrode layer is a 500 nm which is in the claimed ranges. See *page 1061, lines 31-32*.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al. (Mat. Res. Soc. Symp. Proc. Vol. 449, 1997, pp 1061-1065).

Kim et al teaches all claimed invention, as applied to claim 1 above, except for first electrode layer includes a nitride and a compound of Ga-Ni. In view of this

invention, the nitride compound and the Ga-Ni compound were formed in first electrode layer by reaction during the thermal annealing process as described in specification where the N and Ga are supplied from GaN layer (page 6, lines 1-11). The first electrode in Kim's metal electrode structure may also include a nitride and Ga-Ni compound because the Kim's metal electrode structure is also treated by thermal process (page 1062, lines 8-9). It would have been obvious to one having ordinary skill in the art at the time the invention was made to form nitride compound and Ga-Ni compound in the first electrode layer in order to attain the ohmic characteristic.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Okazaki (US 5,990,500)

Shibata et al (US 6,008,539)

Trexler et al. (Mat. Res. Soc. Symp. Proc. Vol. 449. 1997, pp1091-1096)

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Donghee Kang whose telephone number is 703-305-9147. The examiner can normally be reached on Monday through Friday.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on 703-308-2772. The fax phone numbers

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for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Donghee Kang, Ph.D.
June 12, 2001


TOM THOMAS
SUPERVISORY PATENT EXAMINER